

# Montana Traffic Education

## Module 3.1 Fact Sheet: Vision

### STUDENT ACTIVITY 1

While you are reading this passage your partner will notice that your eyes are jumping from word to word. They are not smoothly moving over the text but stopping momentarily at each word or phrase to let your eyes detect what is on the page. Even if you try to read the passage with smooth eye movement your brain intervenes.

### VISION IS A PROCESS

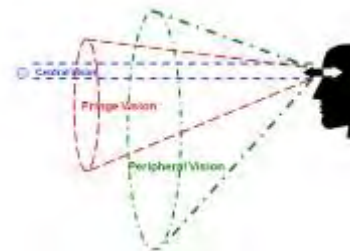
Seeing is not instantaneous. The eyes must first collect different kinds of information. Your eyes can see color, shapes, shadows, contrasts, textures, and things that are near or far. That information enters the eyes through the cornea and lens and strikes the retina, which is in the back of the eye. The retina is full of cells that, when light strikes them, send signals to the brain through the optic nerve.



The information from the eyes needs to be processed by the brain in order to complete the seeing process. You can collect all the visual data in the world but if it doesn't have meaning it is worthless. The brain processes what you see and compares that information with your memories and personal experience to help you "perceive" what you are seeing. Since vision is a process it takes approximately 3 tenths of a second from "seeing to perception" to occur. That is why your eyes jumped from one place to another while you were reading and scanning the picture.

### THE THREE PARTS OF VISION

In order to manage the tremendous amount of information that comes into our eyes the brain breaks up the seeing process into three areas. The first part is **central vision**. It is the part of the eye that has the sharpest part of vision with the greatest amount of detail. Remember in the first activity how your eyes jumped from word to word as you were reading the passage? That was your eyes using your central vision to lock onto the word to see it with the greatest detail and clarity. When driving we use our central vision to see to the target and target area to search for problems that we need to solve.



The second part of vision is **fringe vision**. When we look at our target with our central vision we see the roadway and sides of the roads with our fringe vision. It is not as clear as our central vision but it still gives us vital information about where the car is on the road and whether there are pedestrians, cyclists, or animals near the road.

The third part of vision is your **peripheral vision**. This is the vision that is often referred to as seeing something out of the corner of your eye. This visual field detects movement and changes in contrast. When we do see these changes we want to turn our head to use our central vision to get enough information about what we saw with our peripheral vision to determine what just happened.

## VEHICLE CONTROL SEQUENCE: FIND • SOLVE • CONTROL

Driving is about decision making and critical thinking. Ninety percent of the decisions we make are based on what we “see.” We first have to see what is in our path, then we have to decide what we are going to do with it, and then we have to do it. The Mottola Zone Control System helps us with this task. The steps are very simple and need to be done every time, every drive.

### Find

The first step is to use your eyes to **FIND** the problem. Problems come in the form of something in your path of travel or something that prevents you from gathering critical information that will help you make a better driving decision. We call those problems *Path of Travel (POT)* or *Line of Sight (LOS)* blockages.

You saw some examples in the previous slides. Cars, pedestrians, buildings, curves, hills, and myriad other things cause POT or LOS blockages that you must deal with when you drive. *So where do you think you have to look to find blockages with your POT or LOS?* Remember, it takes time to see something and understand what it is, so you want to detect LOS or POT blockages as far out as possible and the best place to search for these is in your target area. For instance, if a van is parked on the right side of the street it blocks your LOS because you can't see around it and it also blocks your POT because you can't drive there without hitting it.



### Solve

Once you've found it you need to do something with it. This is where your critical thinking comes into play. Based on the information you identified in the **FIND** stage you now have to decide what your best options are. The best option in any driving situation is to create space and time. You do that by changing your lane position, changing your speed and communicating your intentions. So, what would you do about the van we talked about in the Find stage? Because you have an open front and left front zone the best solution would be to slow down and move to lane position 2. That way if someone steps out in front of the van or opens a door you have space and can safely stop if you need to.

### Control

Finally, you have to put your solution to the test. As you near the LOS or POT you have to evaluate the choices you made to make sure they still work. This happens at 4 seconds away from your LOS/POT. Here, you make any last second changes to your solution to deal with anything that wasn't obvious during your **FIND** and **SOLVE** stages. As you approach the van it appears that your choice of lane position 2 and slowing your speed were the right choices. You have space between the van and you are now set up to repeat the process all over again with a new LOS/POT blockage down the road.



Practice doing the Find • Solve • Control sequence on the next set of slides in the presentation.

## DEALING WITH VISION PROBLEMS

Driving is about solving problems effectively. Since 90% of our decisions are based on what we see, anything that interferes with our vision needs to be dealt with. Here are some tips on how to improve your ability to see more effectively when conditions are not optimal.

- Clean windows inside and out
- Clean the lights and be sure they work
- Be sure the defroster and wiper blades are in good working order
- Remove any objects that interfere with vision
- Adjust mirrors properly
- Have on hand: sunglasses, flashlight, windshield scraper

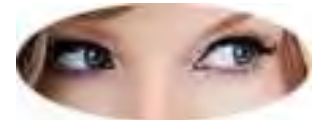


Glare can be reduced if you:

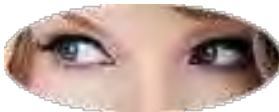
- Wear sunglasses in the vehicle
- Use a greater following distance
- Avoid looking at headlights
- Adjust and use the sun visor
- Squint if you don't have sunglasses
- Slow down until vision improves

## SPEED AND ITS EFFECT ON VISION

The faster you go the less you will see. Why is that? The answer is in the first activity we did. If you look at the first paragraph of this fact sheet remember that the way we see is by making momentary pauses with our eyes as we look at things. It takes time to see because our eyes have to stop briefly to allow information to be gathered and processed.



When you travel at 25 miles per hour you are going approximately 37.5 feet per second. If you pause for .3 seconds so you can perceive something, for every .3 seconds you look at something you will have traveled 10.5 feet. You can see a lot and scan the scene pretty well.



If, however, you are traveling at 70 mph you cover 105 feet per second. Now when you look at something for .3 seconds, you have gone approximately 34 feet before you move on to the next thing to look at. If you look at anything too long you risk missing something critical. However, if you try to keep up with all of visual stimuli with aggressive scanning you will quickly develop eye fatigue. You need to instinctively narrow your field of vision so you can cope with and process all the visual stimuli.